National Science Foundation

IUSE: HSI Program

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Improving Undergraduate STEM Education: Hispanic-Serving Institutions (HSI Program) NSF 20-599

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**American Innovation and Competitiveness Act, Public Law 114-329**

"The Director shall award grants on a competitive, merit-reviewed basis to Hispanic-serving institutions (as defined in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a)) to **enhance the quality of undergraduate STEM education** at such institutions and to **increase the retention and graduation rates** of students pursuing **associate's or baccalaureate degrees** in science, technology, engineering, and mathematics.''

Improving Undergraduate STEM Education: Hispanic-Serving Institutions (HSI Program) NSF 20-599
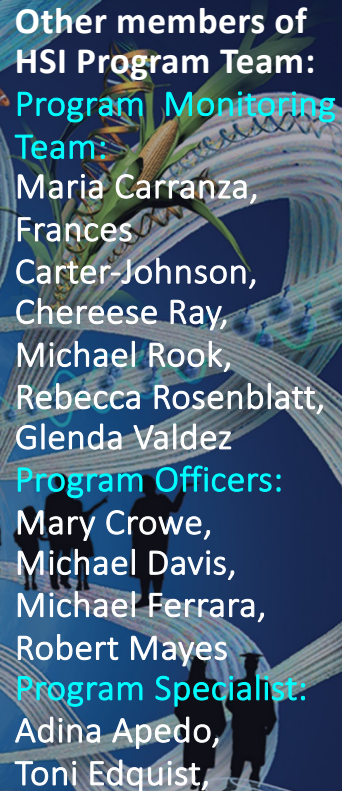

Consolidated Appropriations Act, 2017, Public Law 115-31
"The agreement also directs NSF to establish an Hispanic Serving Institution (HSI) program at no less than $15,000,000…to use this program to **build capacity at institutions of higher education that typically do not receive high levels of NSF grant funding.**"
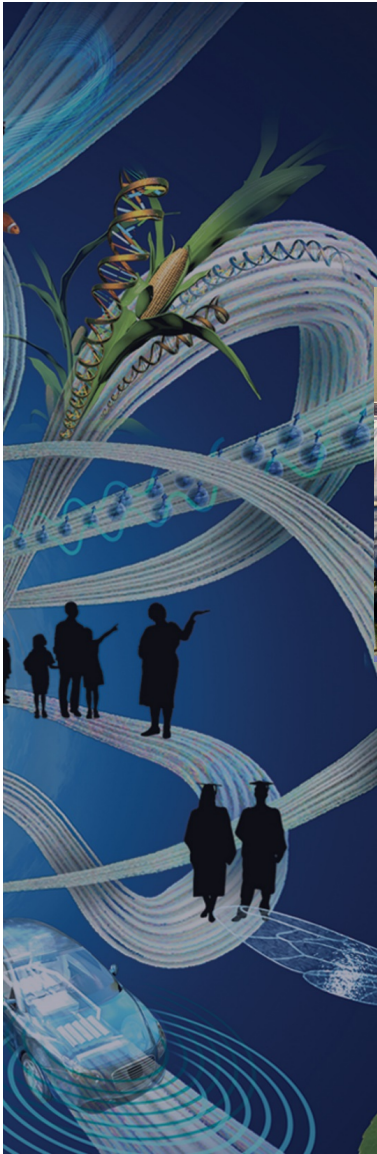
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Program Specialist:
Adina Apedo,
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The HSI Program aims to support organizational capacity building.

As encouraged by Congress, the HSI Program is concerned with

building capacity which should **involve developing structures that foster students' and/or faculty growth** _while meeting the students where they are_ in their college careers academically, financially, and socially.

These institutional structures may include socio-cultural supports and collaborative processes that promote effective learning environments and inclusiveness as well as mechanisms to support personal development and professional learning for students.

See solicitation 20-599 for references.

HSI Program (NSF 20-599) has two major goals.

The goals of the HSI Program are to:

- ✓ enhance the quality of undergraduate STEM education and
- ✓ increase the recruitment, retention, and graduation rates of students pursuing associates or baccalaureate degrees in STEM fields at HSIs.

HSI Program has three major strategies.

These are to

1. support building capacity at HSIs through innovative approaches, including STEM education research capacity

2. incentivize institutional and community transformation and

3. promote fundamental research

    i.   on engaged student learning,

    ii. about what it takes to diversify and increase participation in STEM effectively, and

    iii. that improves our understanding of how to build institutional capacity at HSIs.

HSI Program is co-managed.

Division of Undergraduate Education (DUE)

DUE's programs are intended to strengthen STEM education at two- and four-year colleges and universities by improving curricula, instruction, laboratories, infrastructure, assessment, diversity of students and faculty, and collaborations.

**Dr. Jennifer Lewis
DUE co-lead**

Division of Human Resource Development (HRD)

HRD's programs are intended to increase the successful participation of individuals from historically underrepresented groups in STEM through the creation, implementation, and testing of evidence-based practices, and scaling-up of effective strategies.
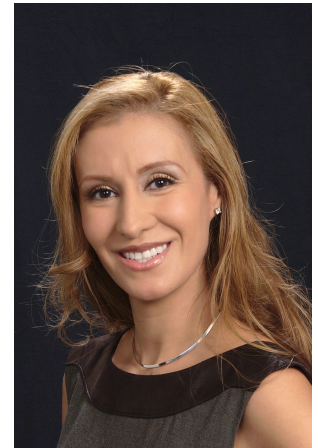
**Dr. Erika Tatiana Camacho,
HRD co-lead**

HSI Program has three tracks.

Track 1: Planning or Pilot Projects (PPP)	Track 2: Implementation and Evaluation Projects (IEP)	Track 3: Institutional Transformation Projects (ITP)
2-year-long projects	3- to 5- year-long projects	5-year-long projects
Funding amount: $200,000 - single institution, $300,000 - collaborative $100,000 incentive to partner with one or more community colleges	Funding Amount: $500,000 - single institution $800,000 - collaborative $200,000 incentive to partner with one or more community colleges	Funding Amount: Up to $3,000,000
Deadline: • January 13, 2021, • August 25, 2021, • Last Wednesday in August, Annually Thereafter	Deadline: • January 13, 2021, • August 25, 2021, • Last Wednesday in August, Annually Thereafter	Deadline: • February 10, 2021 • Second Wednesday in February, Annually Thereafter

There are track-specific eligibility criteria.

Track 1: PPP

An institution must
- **satisfy the definition of an HSI as specified in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a)** and submit the HSI Certification Form;
- **be PUI or New to NSF and** does not need to currently offer STEM degrees or certificates**.**

An institution cannot have more than two active PPP awards or a Track 1 award under the previous solicitations NSF 18-524 **and** NSF 19-540 **.**

There are track-specific eligibility criteria.

Track 2: IEP

An institution must
- **satisfy the definition of an HSI as specified in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a)** and submit the HSI Certification Form;
- offer undergraduate STEM educational programs that result in certificates or degrees.

An institution cannot have more than two active IEP awards or two Track 1 awards under the previous solicitations NSF 18-524 and NSF 19-540 .

There are track-specific eligibility criteria.

Track 3: ITP

An institution must
- **satisfy the definition of an HSI as specified in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a)** and submit the HSI Certification Form;
- offer undergraduate STEM educational programs that result in certificates or degrees.

One submission per institution is allowed. Previous ITP awardees are not eligible to submit a proposal in the ITP track.

Multi-campus systems have additional considerations.

Each campus that is part of a system may be considered a separate institution for HSI program proposal submission purposes
- if the campus is geographically separate from the other campus(es), and
- if the campus has its own chief academic officer.

The 20-599 solicitation has important revisions.

All tracks may support faculty research that is inter-, multi-, or trans-disciplinary, discipline-specific research, STEM education research, discipline-based STEM education research, or broadening participation research.

A **Student Mentoring Plan** is now required for all proposals requesting stipends or wages to support undergraduate or graduate students.

PIs from PPP are required to attend the **research design and evaluation workshop** prior to the annual PI meeting.

All tracks are encouraged to take an intersectional lens when considering their proposed work in context of the student body they serve.

Conference proposals may be submitted by institutions of higher education, including non-HSIs, and non-profit organizations.

All STEM fields supported by NSF are supported by the HSI Program.

All tracks may support faculty research.

Proposed faculty research should

- support the overarching goals of the HSI program,

- improve and enhance undergraduate STEM education, including undergraduate student research experiences, and

- explain how it will catalyze new faculty research activity in addition to supporting on-going faculty research activities.

Each faculty member receiving research funds must include a 4-page *Faculty Research Plan* in which 1-2 pages are used to describe the faculty member's track record in diversity, equity, and inclusion (DEI), mentoring, and advancing diverse students in STEM.

Institutional data narrative is required for all tracks.

Each proposal must include **institutional data with a narrative** describing and contextualizing the institution's need for the proposed project and potential to build capacity for excellent undergraduate STEM education.

Institutions should incorporate a well-thought-out plan to move toward their institution's current overall level of diversity in their enrollment/ graduation rates within the STEM fields, if they are not there.

- Mechanisms that will be put in place to achieve this goal can be part of the proposed project.

Proposals may also provide IPEDS data or spreadsheets from the HSI's Office of Institutional Research (or other office) with data.

The IEP and ITP tracks require institutional baseline data.

For the **IEP and ITP tracks**, baseline data may include
1. institutional data of *student demographics and enrollment* in the proposing HSI(s) *in general and across all STEM fields*;

2. *student demographics and enrollment **for each discipline*** that is included in the proposed project; and/or

3. *student retention and graduation rates **for each discipline*** that is included in the proposal.

Data for all sub-awardees is required.

Track 1: Planning or Pilot Projects (PPP)

The PPP provide a two-year funding opportunity for institutions that are **new to New to NSF or are Primarily Undergraduate Institutions (PUIs), including community colleges**.

The PPP track seeks to enhance undergraduate STEM education and build capacity at less-resourced institutions and to increase **these institutions' ability to compete for NSF funding**.

Planning and Pilot Projects **may focus entirely on education or broadening participation research initiation efforts.**

All PPP **must generate new knowledge** through **project evaluation** activities and articulate a **plan for dissemination** of their findings.

PPP consist of two types of projects.

Planning projects are to undertake the activities necessary to develop a future HSI program IEP or ITP track proposal.

- E.g., undertake an undergraduate STEM education institution-wide assessment and catalyze the necessary collaborations/ partnerships.

Pilot projects are to achieve a short-term, well-defined goal to enhance the availability of high-quality undergraduate STEM education at the HSI and gather preliminary data for future HSI program IEP or ITP track proposals.

- E.g., Develop fundamental STEM education research capacity on student learning at HSIs, discovering effective means for diversifying and increasing participation in STEM.
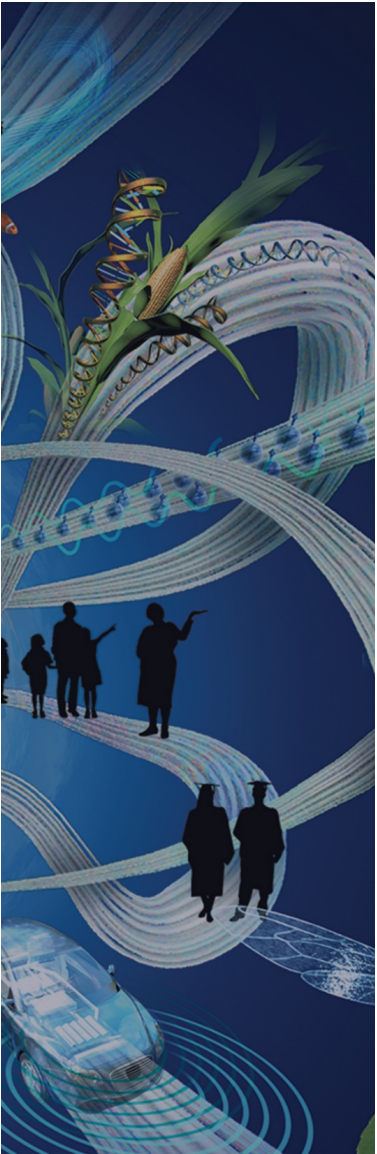
PPP may **integrate various expertise.**

Proposers are encouraged to include:

- Disciplinary, educational, and social behavioral researchers; and
- Assessment and evaluation experts and advisors.

Planning Projects should focus on capacity.

Projects may **focus on one or more STEM disciplines** and **address access to STEM courses and degrees based on the institution's current STEM undergraduate program capacity** and long-term plans.

Planning Projects can consist of multiple activities.

Examples of planning project activities include,
- completing **an institution-wide STEM undergraduate needs assessment**;
- Audit prior institutional efforts;
- conducting a **literature review** to identify potential evidence-based practices to implement;
- **site visits** to learn about promising practices in STEM undergraduate education;
- learning about relevant **theories of change**;
- Identify relevant **institutional practices and policies;**
- **faculty development** on **STEM education** or **broadening participation research skills;**
- **data collection** to support scale up of effective local strategies;
- **catalyzing cross-sector partnerships** (with industry, academic institutions, non-profit organizations, government agencies, and local communities); and
- formulate plans for advancing future IEP or ITP submissions.

Pilot Projects can consist of multiple activities.

Examples of possible pilot project activities include the implementation of evidence-based strategies to

- make improvements to the HSIs undergraduate **STEM curriculum and co-curricular program**s;
- **broaden the participation** of historically underrepresented groups in STEM.;
- **create courses** necessary for a **new STEM degree program**;
- examining the **impact of** undergraduate research on student retention.

Projects can **adapt previously successful approaches to a new institutional context and/or STEM discipline**, and study the impact of the adaptation.

Projects should have **a well-defined, measurable outcome aligned with one or more of the HSI program goals**.

Projects may be focused **on training students in high demand fields**, including artificial intelligence, data science, quantum computing, and advanced manufacturing.

Track 2: Implementation and Evaluation Projects (IEP)

The IEP provide a three- to five-year funding opportunity to all HSIs **for STEM unit-, department-, or multi-department-level projects** to enhance undergraduate STEM education.

IEP can include activities that **strengthen the research base in (i) STEM education** and/or **(ii) broadening participation**.

The IEP track supports

- **research studies** that **promote one or more of the HSI program goals**;
- **replication or adaptation studies that examine one or more of the HSI program goals** in the context of the proposing institution.

The focus of the IEP should be supported by **institutional data** showing STEM undergraduate education areas that need improvements.

Components required of an IEP proposal.

All IEP must include

- diverse teams with expertise to implement the proposed project, such as educational or/and social behavioral researchers and assessment/evaluation experts,

- a STEM **education research component,** a **project evaluation,** and **dissemination components**,

- **institutionalization and sustainability plan** for its proposed activities, and

- complete information on the **outcomes and impact of the previous HSI program awards** under this and previous solicitations.

A new proposal should be based on a thorough evaluation and assessment of both previous NSF awards related to STEM education and an assessment of the current state of the institution.

The IEP's activities should be evidence-based and connect to the HSI strategic plan.

Projects may focus on any areas of interest to the institution and the HSI community, such as critical transitions, cross-sector partnerships, building capacity, gatekeeper courses, co-curricular programs, recruitment, retention and graduation, and broadening participation efforts for historically underrepresented groups in STEM.

The project goals and proposed activities should be **based on the existing STEM education and/or behavioral science science literature** and **aligned with the long-term plans of the unit(s) or department(s)**.

Approaches taken to improve undergraduate STEM education should have a **direct connection to the strategic plans for STEM in the unit(s) or department(s**) and be described in the proposal.

The IEP may focus on multiple areas.

Activities may consist of

- research on indicators of effective and successful undergraduate STEM education at HSIs

- improvements to a single STEM course and associated interventions that enable students to succeed at a single unit or department,

- enhancement to hands-on experience and targeted mentoring and/or advising for students with high financial need,

- collaborations or partnerships among several institutions implementing similar interventions, and

- coordinated improvements to student support service units or to one or more introductory STEM courses at all partnering institutions.

IEP activities can involve students, part-time faculty, non-tenure-track faculty, and tenure-track and tenured STEM faculty.

Track 3: Institutional Transformation Projects (ITP)

The ITP provide a five-year funding opportunity to all HSIs **for institution-wide, systemic change projects grounded in STEM education research and broadening participation research**.

The ITP should be designed to make **institutional infrastructure and changes** to support **long-term institutional changes** that encourage and support faculty to implement **evidence-based practices that enhance student outcomes in STEM** at the proposing HSI.

ITP should **impact all STEM disciplines** at the proposing HSI.

The ITP proposed structural or systemic changes are expected to be **institutionalized and sustained** by the HSI.

One submission per institution and one award per life of the track is allowed for ITP.

ITP must be grounded in one or more theories of organizational change.

ITP should

- **create institution-wide strategies to transform** educational policies and practices as well as campus climate that shape and influence students' academic experiences, access to resources, and success;

- **align with the institution's mission and strategic plan** and consider its surrounding community;

- demonstrate **evidence of institutional commitment** to the proposed work.

E.g., impact unwelcoming practices in one or more courses or departments in STEM that may negatively affect students' consideration of, enrollment in, and completion of a STEM degree.

ITP should transform a specific HSI.

To help ensure this, the ITP PI team

- should comprise a **multidisciplinary team with the expertise** and experience needed to implement the proposed project;

- should include **an upper-level administrator with institution-wide responsibility and authority over STEM educatio**n at the institution;

- may have **members from other institutions or non-profit organizations** (through subcontracts) to augment the team's expertise, which should be explained in the project description and management plan.

Research on building HSI institutional capacity in STEM is encouraged for ITP.

Research should result in a strategic understanding about how the multiple components of the HSI program goals work synchronously to advance STEM education.

ITP may

- involve the **adaptation of evidence-based strategies** and/or the **design and implementation of innovative strategies**;

- conduct research that advances understanding of the **institutional culture and identity on students' learning outcomes** in undergraduate STEM education;

- investigate the interplay of the **institutional identity and students' social identities affecting students' STEM success**.

ITP must include project evaluation, a dissemination plan, and an education research component.

ITP activities must lead to systemic change.

Examples of **systemic change activities** may include creating new

- instructional resources available to all STEM departments,

- infrastructure to support faculty use of evidence-based teaching strategies in all STEM classrooms and labs,

- expectations for faculty teaching and service, and

- policies for faculty hiring, promotion, salary, and tenure.

It may also include hiring of new STEM education research faculty to support improvements and monitoring of undergraduate STEM education.

Continual improvement of all systemic change activities is expected beyond the life of the award.

Required Components for All Proposals

Project Description

- Description of the HSI context and undergraduate STEM education offerings
- Description of the specific project components to be implemented
- Project management plan
- Communication plan
- Commitment and sustainability plan
- Project evaluation
- **STEM education research plan** (IEP and ITP proposals only)

Supplementary Documentation

- Letters of collaboration or commitment
- Faculty Research Plan(s), if applicable
- Student Mentoring Plan(s), if applicable
- Postdoctoral Mentoring Plan, if applicable
- Data Management Plan
- HSI Certification Form
- Biographical Sketch of the independent evaluator(s), PIs/co-PIs, and senior personnel
- Certification of PUI Eligibility, if applicable (PPP only)
- Institutional Data Narrative

Non-profit organizations may submit proposals for conferences/ workshops.

These may

- address increasing the diversity of institutions and faculty participating in the HSI program;

- catalyze knowledge exchange in the training of undergraduates at HSIs in areas related to the NSF Big Ideas and industries of the future;

- speak to the complex challenges at HSIs and their diverse student populations;

- promote building communities among HSIs (both HSI awardees and non-awardees) where resources can be leveraged.

Conference proposals may be submitted at any time following consultation with an HSI program officer. Information about preparing a conference proposal is contained in PAPPG Chapter II.E.7.

Thank you for your attention!

HSI Resources

HSI Program solicitation, **NSF 20-599**: https://www.nsf.gov/pubs/2020/nsf20599/nsf20599.htm

Program Website: https://nsf.gov/ehr/HSIProgramPlan.jsp

FastLane Help Desk: 1-800-673-6188 or e-mail Fastlane@nsf.gov

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